REMARKS

Favorable reconsideration and allowance of the present application are respectfully requested in view of the foregoing amendments and the following remarks.

Currently, claims 15-21 and 43-56 are pending in the present application, including independent claims 15, 48, 51, and 54. Independent claim 1, for instance, is directed to a fused or chimeric polypeptide that comprises a first component chemically bound to a second component. The first component includes a polypeptide that specifically binds to at least one of $\alpha 6\beta 1$ integrin receptor and $\alpha 6\beta 4$ integrin receptor and the second component comprises an agent for use in the destruction or neutralization of a pathogen comprising on the surface of the pathogen at least one of $\alpha 6\beta 1$ integrin receptor and $\alpha 6\beta 4$ integrin receptor. More specifically, the polypeptide of the first component comprises the G3 subdomain of the laminin-5 $\alpha 3$ chain or a fragment, homolog, or ortholog thereof.

In the Office Action, the specification and claims 15 and 18 were objected to for various reasons as listed in paragraphs 6-10 of the Action. The presently presented amendments include corrections that are believed to overcome these objections.

In the Office Action, claims 18, 48-52, and 54-55 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In the presently presented claims, the Markush format of claim 18 has been amended to include the term "and" rather than "or" and the language of claims 48, 51, and 54 has been amended to more clearly describe the fused or chimeric proteins. Accordingly, Applicants respectfully submit that the presently presented claims are in compliance with 35 U.S.C. §112, second paragraph.

In the Office Action, claims 15-21, 43-49, 51-52, and 54-55 were rejected under 35 U.S.C. §112, first paragraph. Specifically, the claims were rejected as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention. More specifically, the specification disclosure was cited at not enabling

one skilled in the art to practice the invention without an undue amount of experimentation.

The presently pending claims are directed to fused or chimeric proteins. The Applicants respectfully submit that the specification of the pending application, in conjunction with the information that was well know to persons of ordinary skill in the art, adequately describes both how to make the presently claimed inventions and how to use the presently claimed inventions.

The fused or chimeric polypeptides of the presently pending claims include a first component chemically bound to a second component. Included in the scope of the pending claims are limitations as to both the structure and function of this first component. For example, the first component of claim 15 includes a polypeptide comprising the G3 subdomain of the laminin-5 α3 chain or a fragment, homolog, or ortholog thereof. Specific examples of this structure are disclosed in the specification, for example, the polypeptide sequences specific to rat laminin described in the application as SEQ ID NO: 2, 4, and 6, as well as other known, homologous proteins that can be utilized to obtain polypeptides comprising the G3 subdomain of the laminin-5 α3 chain, e.g., mouse laminin-5, Mus musculus laminin-5, artificial laminin-5 and human laminin-5 (see, e.g., paragraph [041]). As these materials as well as sources for these materials are well known to one of skill in the art, particular information detailing all aspects of this information was not included in the application, as information that is well known to persons of ordinary skill in the art is preferably omitted from the application.

For instance, Kariya, et al. have described methods for forming smaller or truncated forms (i.e., fragments) of the G3 subdomain of the α3 chain (see, for example, Kariya et al., 2003 (published prior to the application date of the pending application and previously submitted in an Information Disclosure Statement). In addition, many homologous or orthologous α3 genes are well known in the art, all of which include the G3 subdomain. For instance, available in the the NCBI GenBank database are sequenced α3 genes for mouse (*Mus musculus* (Accession nos. XM_140451, X84014, X84013, and AK141255), *Homo sapiens* (Accession nos. NM_198129.1, NM_000227.2, AY327116.1, AB208853.1, AY327115.1,

AY327114.1, L34155.1, X84900.1, and AB107369.1), *Bos taurus* (Accession no. XM_614615.2), and *Canis familiaris* (Accession no. XM_537297.2). In addition, it is well within the knowledge of one of ordinary skill in the art to translate these genetic sequences via the well-known and publicly available orf's to polypeptide sequences comprising the G3 subdomain of the laminin-5 α3 chain, as described in pending claims 15-21, and 43-47, or a segment of the G-domain, as described in pending claims 48-56.

For example, it would be well within the abilities of one of ordinary skill in the art to utilize the specific sequences described in the presently pending specification (e.g., SEQ ID NO: 1, 3, and 5) and blast these sequences against known α3 genes (e.g., those in the NCBI GenBank database) and then translate these sequences to the polypeptides by use of the known orf's to obtain the homologues and orthologs of the disclosed polypeptides (e.g., SEQ ID NO: 2, 4, and 6). In fact, this process has been carried out by the present inventors to obtain polypeptides comprising the G3 subdomain of other species, in addition to the rat sequences specifically disclosed in the application. The sequence identities of these various species G3s with the disclosed rat sequence (SEQ ID NO: 6) were found to be as follows: mouse – 92% of 100% rat G3 transcript, human – 85% of 85% rat G3 transcript, bovine – 83% of 78% rat G3 transcript, and dog – 86% of 59% rat G3 transcript.

The first component of the fused or chimeric polypeptides of claim 15 does not encompass just any polypeptide comprising the G3 subdomain or a segment of the G domain of the laminin-5 α3 chain, however. This first component is also limited as to the function of the polypeptide, as the claim encompasses only those polypeptides meeting this structure limitation that also specifically bind to at least one of α6β1 integrin receptor and α6β4 integrin receptor. While aspects of making of the claimed invention, for example, blasting the desired specific sequence against other known sequences, transcribing the nucleotide sequences into the polypeptides, comparing sequence identities to the disclosed polypeptides, and the like, may require some experimentation, the level of experimentation required to make the claimed invention is not undue given the level of skill in the art and the teachings of the disclosure. Accordingly, Applicants respectfully maintain that one in

the art would know how to make the first component of the invention as described in the pending claims.

The invention encompassed by the pending claims also includes a second component bound to the first component. The specification and pending claims describe this second component as a material that "can aid in destruction or neutralization of the pathogen" (e.g., see paragraph [059]). Moreover, the specification provides specific examples and sources for several exemplary polypeptide components at paragraph [059], as well as non-protein components at paragraph [061] that can be included in this second component. In addition, other materials suitable for use as the second component of the claimed fused or chimeric polypeptides are generally known to one of ordinary skill in the art, and thus all possible materials have not been explicitly described in the specification.

As described in the pending claims, the first and second components of the fused or chimeric polypeptides are chemically bound to one another. There are many well know methods for chemically binding the two components to one another, for example, IL-2 has been described as a fusion partner with a different protein delivery system in Zhang et al., 2002 (submitted in an Information Disclosure Statement concurrently with this Response). Other well known methods for forming fusion polypeptides such as those described herein include methods such as those described by Beck, et al., 2003, and Langenheim and Chen, 2005, both of which have been submitted in an Information Disclosure Statement concurrently with this Response. These and other methods are known to those of skill in the art, and thus have not been described in detail within the pending specification.

Accordingly, applicants respectfully submit that given the information provided in the specification, one of ordinary skill in the art would be capable of making the inventions of the pending claims. Specifically, Applicants submit that one of ordinary skill in the art would know how to make the fused or chimeric polypeptides of the pending claims.

Applicants further submit that given the information provided in the specification, one of ordinary skill in the art has also been provided with adequate detail in regard to how to use the inventions of the pending claims.

For example, the specification clearly details exemplary methods for how to bind the disclosed materials to a pathogen including at least one of $\alpha 6\beta 1$ integrin receptor and $\alpha 6\beta 4$ integrin receptor (e.g., see the example section of the specification). Moreover, the specification clearly describes the second component of the polypeptides as an agent for use in the destruction or neutralization of a pathogen, and one of ordinary skill in the art would know how to use the disclosed materials to destroy or neutralize the described pathogens. For example, in the particular embodiment of the selected species, IL-2, this particular agent of the second component is a known agent capable of stimulating T cells, and specifically cytotoxic T-cells, when the T cell sees its antigen (i.e., the pathogen). As described in the specification, one possible use for the chimeric and fusion proteins can be to deliver the second component directly to the pathogen (e.g., paragraph [059]. Accordingly, one of ordinary skill in the art would know that the disclosed polypeptides that include IL-2 as the second component could be used to deliver the IL-2 directly to the pathogen and thus enhance stimulation of cytotoxic T-cells in the presence of the pathogen, e.g., cancer cells, which can in turn lead to the destruction or neutralization of the pathogen. Moreover, this use can be carried out either *in vivo* or *in vitro*. For instance the disclosed materials could be utilized in determining pathogen proliferation in the presence of various concentrations of the fusion polypeptides, as described in the example section of the specification for polypeptides including only the first component of the presently claimed products.

Among the many possible ways to use the inventions of the presently pending claims are both *in vivo* uses and *in vitro* uses. For example, in addition to the described *in vivo* thereapeutic uses, the specification clearly describes how to use the materials *ex vivo.* For instance, methods such as those described in the example section can be beneficial in developing treatment methods and materials through examination of the specific contribution the second component to the neutralization or destruction of a particular pathogen through, e.g., examination of the proliferation of a pathogen in the presence of the materials, as described in Examples 4 and 5 of the application. Hence, the materials can be utilized in an *in vitro* method such as that specifically described in the example section to increase

the understanding of communication and interactions between the various components of the fused or chimeric polypeptides of the presently pending claims and specific pathogens that can be closely examined *in vitro*. Many other methods of using the fused or chimeric proteins of the presently pending claims would be understood by one of ordinary skill in the art upon examination of the specification, and thus all possible ways to use the disclosed materials and exactly how to use the disclosed materials in each of those methods has not been described in detail in the specification.

Applicants respectfully maintain that the presently pending claims comply with the requirements of 35 U.S.C.12, second paragraph. In particular, Applicants maintain that given the specification of the pending application, one of ordinary skill in the art would be enabled to practice the inventions as encompassed in the pending claims without an undue amount of experimentation.

In the Office Action, claims 54 and 55 were rejected under 35 U.S.C. §102(b) as being anticipated by Goldfinger, et al. and as being anticipated by Lazarova, et al. and claims 51, 52, 54, and 55 were rejected under U.S.C. §102(b) as being anticipated by Shang, et al. As presently amended, the fused or chimeric polypeptide of claims 51, 52, 54, and 55 includes a fused or chimeric polypeptide comprising a first component and a second component chemically bound to the first component. Specifically, the second component includes an agent for use in the destruction or neutralization of a pathogen comprising at least one of $\alpha 6\beta 1$ integrin receptor and $\alpha 6\beta 4$ integrin receptor on the surface of the pathogen. While the His residues of Goldfinger, et al. and Shang, et al. and the GST of Lazarova, et al. may be considered polypeptides and they may be fused to a polypeptide comprising the G3 subdomain of the a laminin-5 $\alpha 3$ chain, Applicants respectfully submit that they would not be considered an agent for use in the destruction or neutralization of a pathogen, as is found in presently presented claims 51, 52, 54, and 55. Accordingly, Applicants respectfully submit that presently pending claims 51, 52, 54 and 55 patentably define over the cited references.

It is believed that the present application is in complete condition for allowance and favorable action, is therefore requested. Examiner Haddad is invited

and encouraged to telephone the undersigned, however, should any issues remain after consideration of this Amendment.

Please charge any additional fees required by this Response to Deposit Account No. 04-1403.

Respectfully submitted,

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11/08/05 BY: _____

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